



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/434,282	11/05/1999	THIERRY CHAPUS	PET-1581-D1	3767

23599 7590 03/12/2003

MILLEN, WHITE, ZELANO & BRANIGAN, P.C.
2200 CLARENDON BLVD.
SUITE 1400
ARLINGTON, VA 22201

EXAMINER

LEUNG, JENNIFER A

ART UNIT	PAPER NUMBER
----------	--------------

1764

DATE MAILED: 03/12/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/434,282

Applicant(s)

CHAPUS ET AL.

Examiner

Jennifer A. Leung

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11,12,15,16 and 18-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-12, 15-16, and 18-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 08/936,101.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Applicant's Amendment filed on December 13, 2002 has been received and carefully considered. The submitted changes to the Specification and the new Drawing are acceptable. Claims 1-10, 13-14, and 17 are cancelled. Claims 18-24 have been added. Claims 11-12, 15-16, and 18-24 remain active.

Information Disclosure Statement

2. A copy of the initialed and signed Information Disclosure Statement filed on November 15, 1999 is submitted herewith, being inadvertently missed in the prior Office Action.

Drawings

3. The submission of a Brief and Detailed Description for new Figures 1A, 1B and 1C in the Specification is required. No new matter should be entered.

Claim Objections

4. Claims 12, 16, 18 and 24 are objected to because of the following informalities:

With respect to claim 18, "reduce" (line 1) should be changed to -- reduced --.

Furthermore, "; and" (line 23) should be replaced with -- . -- (i.e. a period).

With respect to claim 12, "said gasoline cut inlet line (4)" (lines 5-6) should be changed to -- said gasoline cut inlet line -- for consistency in claim terminology, since reference character "(4)" has been used to designate the "second discharge line". See also claim 16, line 5.

With respect to claim 24, the word "of" in the phrase, "said first catalyst zone of said second catalyst zone." should be changed to -- and --.

Claim Rejections - 35 USC § 112

5. Claims 11-12, 15-16, and 18-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 18, it is unclear as to the relationship between, “a treatment zone (7)” (line 21) to “a treatment zone (7)” as set forth in lines 9-10. Likewise, “a first gasoline cut” (line 8) to “a first gasoline cut” set forth in line 4.

With respect to claim 11, it is unclear as to the relationship of “a first gasoline cut” (line 4) to “a first gasoline cut” set forth in claim 18, line 4. Furthermore, in the event that the “treatment zone (7)” is selected in claim 18 (i.e. lines 15-16, “said apparatus also comprising at least one of the following:”), it is unclear as to the relationship between, “a selective diene hydrogenation zone” (lines 1-2) and “a treatment zone (7)” set forth in claim 18, lines 9-10, 21. As indicated in Applicant’s Amendment (page 5, paragraph 3), “the selective diene hydrogenation zone is represented by zone 7 in the drawings.” If this is the case (i.e. the two zones are the same, or the treatment zone comprises the selective diene hydrogenation zone), the claims must be amended to reflect such relationship between the two elements. Likewise, a relationship must be established between the corresponding structures of the two elements (i.e. the relationship of “a gasoline inlet line” (line 3) to “a gas cut inlet “ (claim 18, line 21) and “a dedienized first gasoline cut outlet line” (line 5) to “a treated gasoline cut outlet line” (claim 18, line 22). Also, see claim 23, line 3, for consistency of “the gasoline cut inlet line”.

With respect to claim 12, it is unclear as to the relationship between “a second gasoline cut” (lines 2, 4) to “a second gasoline cut” set forth in claim 18, line 5. See also claim 16, line 2.

With respect to claim 15, the claim lacks proper positive antecedent basis due to its dependence on cancelled claim 13. Furthermore, it is unclear as to the relationship between “a first gasoline cut” (line 4) and “a first gasoline cut” set forth in claim 18, line 4. Furthermore, in the event that the “treatment zone (7)” is selected in claim 18 (i.e. lines 15-16, “said apparatus also comprising at least one of the following:”), it is unclear as to the relationship between, “a selective diene hydrogenation zone” (lines 1-2) and “a treatment zone (7)” set forth in claim 18, lines 9-10, 21. Likewise, “a gasoline inlet line” (line 3) to “a gas cut inlet” (claim 18, line 21), and “a dedienized first gasoline cut outlet line” (lines 4-5) to “a treated gasoline cut outlet line” (claim 18, line 22). Please see the comments made with respect to claim 11 above.

With respect to claim 20, it is unclear as to the relationship of “a catalyst comprising at least one group VIII metal and a support” to the “at least one catalyst bed containing 0.1-1% palladium deposited on a support” set forth in claim 18, lines 22-23 (i.e. in the case that the “treatment zone (7)” and “selective diene hydrogenation zone” are one and the same; see comments in claim 11 above). Likewise, the relationship to “a support” in claim 21.

With respect to claim 23, “said first catalyst zone” (lines 2, 4) and “said second catalyst zone” (line 2) lack proper positive antecedent basis. Likewise in claim 24, lines 2-3. Furthermore, it is unclear as to the relationship of “said hydrogenation zone contains a first catalyst bed and a second catalyst bed” (lines 1-2) to the “at least one catalyst bed” set forth in claim 18, lines 21-23 (i.e. in the case that the “treatment zone (7)” and “selective diene hydrogenation zone” are one and the same; see comments in claim 11 above).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 11, 15 and 18-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Parker (U.S. 3,457,163).

With respect to claim 18, Parker (generally, column 2, lines 11-29; column 3, lines 19-73) discloses an apparatus comprising:

A fractionation column **15** having a gas inlet line **14**, a first discharge line **17** for removing a first gasoline cut from an upper portion of said fractionation column **15**, and a second discharge line **16** for removing a second gasoline cut from a lower portion of said fractionation column **15** (FIG; column 5, line 64 to column 6, line 4);

A hydrotreatment zone **34** comprising a catalytic bed, a gasoline cut inlet line **33** for introducing the first gasoline cut, said gasoline cut inlet line **33** being in fluid communication with either said first discharge line **17** of said fractionation column **15** or with a treatment zone **21** containing a palladium catalyst, said treatment zone **21** being positioned between said first discharge line **17** and said hydrotreatment zone **34**, said hydrotreatment zone **34** also comprising a hydrotreated effluent outlet line **35** (FIG; column 6, lines 5-16; column 7, lines 3-16); and

A stripping zone (i.e. separation zone) in fluid communication with said hydrotreated effluent outlet line **35** of said hydrotreatment zone **34**. Although Parker does not explicitly recite a “hydrotreated gas inlet”, a “H₂S outlet line”, or a “stripped gasoline outlet line”, such inlets and outlets are inherent of the apparatus (i.e. to enable the introduction of effluent into the separation

Art Unit: 1764

zone, the separation of hydrogen sulfide, and the recovery of product), and furthermore, the Examiner takes Official Notice that the provision of inlets and outlets is well known to those skilled in the art (FIG; column 7, lines 15-22).

Parker further discloses the treatment zone **21** comprises a gas cut inlet **20** connected to said first discharge line **17** of said fractionation column **15**, a treated gasoline cut outlet line **22**, and at least one catalytic bed containing 0.1 to 1% of palladium deposited on a support (i.e. a preferred catalyst comprising 0.05% to about 5% by weight of palladium on an alumina support; column 5, lines 1-21; FIG.).

With respect to claims 11 and 15, Parker (column 6, lines 5-39; claim 5, step (c); FIG.) further discloses the treatment zone **21** comprises a selective diene hydrogenation zone located between said fractionation column **15** and said hydrotreatment zone **34**, said hydrogenation zone comprising a gasoline inlet line **20** in fluid communication with said first discharge line **17** for introducing the first gasoline cut, and a dedienized first gasoline cut outlet line **22**.

With respect to claim 19, Parker further discloses said catalytic bed in said hydrotreatment zone **34** contains a catalyst having at least one group VIII metal, at least one group VI metal, or a combination thereof (i.e. comprising nickel and molybdenum; column 7, lines 3-14).

With respect to claim 20, Parker further discloses said selective diene hydrogenation zone **21** contains a catalyst comprising at least one group VIII metal and a support (i.e. palladium on alumina; column 5, lines 1-21)

Art Unit: 1764

With respect to claim 21, Parker further discloses said catalyst of said selective diene hydrogenation zone **21** comprises 0.1 to 1% of palladium deposited on a support (i.e. comprising 0.05% to about 5% by weight of palladium on an alumina support; column 5, lines 1-21).

Instant claims 11, 15 and 18-21 structurally read on the apparatus of Parker.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parker (U.S. 3,457,163) in view of Louie et al. (U.S. 3,457,163).

With respect to claims 12 and 16, Parker is silent as to whether the apparatus may further comprise a hydrotreating zone and stripping column for treating the second gasoline cut **16**. Louie et al. (FIG. 1; column 4, line 3 to column 6, line 61) teach an apparatus for segregated hydrotreating of two gasoline cuts separated by a fractionation column **2**, wherein the apparatus comprises a separate hydrotreating zone **10** for hydrotreating the second gasoline cut **4**, said hydrotreating zone **10** having a gasoline cut inlet line which is in fluid communication with a second discharge line **4** for introducing the second gasoline cut from said fractionation column **2**, a first hydrotreated cut outlet line **12**, and a hydrogen supply line **6** connected to said gasoline cut inlet line, and a stripping column **18** having a hydrotreated cut inlet line in fluid communication with said first hydrotreated cut outlet line **12**, an H₂S outlet line ("H₂S SCRUBBING" line), and

Art Unit: 1764

a second hydrotreated cut outlet line (exiting **18** and in flow communication with **19**). It would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide an additional hydrotreating zone and stripping column for treating the second gasoline cut for the apparatus of Parker, on the basis of suitability for the intended use and absent showing any unexpected results thereof, in order to enable desulfurization and recovery of product from the second gasoline cut in addition to the first gasoline cut.

Furthermore, such parallel arrangement provides improved performance and more controlled desulfurization by enabling separate hydrotreatment conditions for each gasoline cut, on the basis of the composition and characteristics of each cut, as taught by Louie et al. (Abstract; column 3, lines 26-51).

8. Claims 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parker (U.S. 3,457,163) in view of Cosyns et al. (U.S. 4,208,271).

With respect to claim 22, Parker is silent as to whether said catalyst of said selective diene hydrogenation zone **21** may further comprise 1 to 20% by weight nickel. However, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide such a catalyst for the selective diene hydrogenation zone in the apparatus of Parker, on the basis of suitability for the intended use and absent showing unexpected results thereof, since catalysts comprising nickel are conventionally known in the art of selective hydrogenation, as evidenced by Cosyns et al. (column 1, lines 41-42), and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233. In addition, Cosyns et al. teach a catalyst composition for selective hydrogenation comprising

Art Unit: 1764

palladium and nickel, wherein the palladium content is preferably from 0.1 to 0.5 weight % and the nickel content is preferably from 5 to 20 weight % (column 3, lines 9-12).

With respect to claim 23, Cosyns et al. further teach that said catalyst, as taught above, comprises a first catalyst bed and a second catalyst bed, wherein said first catalyst bed is disposed upstream of said second catalyst bed (i.e. "gasoline and hydrogen are first passed over a catalyst comprising supported palladium metal [the first catalyst bed], and then over a catalyst comprising supported nickel metal [the second catalyst bed]; column 2, lines 1-16). Thus, inherently, the first catalyst bed would be in fluid communication with the gasoline cut inlet line 20 and said second catalyst zone would be in fluid communication with said first catalyst zone in the modified apparatus of Parker, in order to enable the successive passing of gasoline and hydrogen over the first catalyst bed and subsequently the second catalyst bed. It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide such a dual bed configuration for the catalyst of the modified apparatus of Parker, because the configuration obviates the disadvantages of prior art selective hydrogenation catalysts, such as low catalytic activity in highly sulfurous streams, as taught by Cosyns et al. (column 1, line 39 to column 2, line 16).

With respect to claim 24, Cosyns et al. further teach that said first catalyst zone, as taught above, is at most 75 volume % of the total volume of said first catalyst zone and said second catalyst zone (i.e. namely 1/3 of the total catalyst volume; column 4, EXAMPLE 3).

9. Claims 12 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Louie et al. (U.S. 4,990,242) in view of Guth et al. (U.S. 3,847,800).

With respect to claim 18, Louie et al. (FIG. 1) disclose an apparatus comprising:

Art Unit: 1764

A fractionation column **2** having a gas inlet line **1**, a first discharge line **3** at an upper portion of said fractionation column **2**, and a second discharge line **4** at a lower portion of said fractionation column **2** (column 4, lines 3-21);

A hydrotreatment zone **9** comprising a catalytic bed, a gasoline cut inlet line for introducing the first gasoline cut, said gasoline cut inlet line being in fluid communication with said first discharge line **3** of said fractionation column **2**, said hydrotreatment zone also comprising a hydrotreated effluent outlet line **11** (column 4, lines 22-54); and

A stripping zone **17** comprising a hydrotreated gas inlet in fluid communication with said hydrotreated effluent outlet line **11** of said hydrotreatment zone **9**, an H₂S outlet line ("H₂S SCRUBBING" line), and a stripped gasoline outlet line **19** (column 6, lines 23-36).

Louie et al. further disclose that subsequent to the stripping zone, "in many cases, the liquid products are given a light caustic wash to assure complete removal of H₂S," (column 6, lines 37-61), thereby comprising a further sweetening zone. However, Louie et al. are silent as to whether the removal of H₂S in the sweetening zone may be accomplished by introducing an oxidizing agent into the zone. Guth et al. teach a method and apparatus for the removal of sulfur compounds present in a broad range of sulfur compounds, including hydrogen sulfide, wherein a sweetening zone comprises a gas inlet ("OIL FEED"), an oxidizing agent supply line **13** for introducing oxidizing agent (i.e. NO₂), and a stripped and sweetened gasoline outlet line ("LOW SULFUR OIL OUTPUT") (column 3, line 36 to column 4, line 30; FIG. 1). It would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to substitute the means for removal of sulfur compounds as taught by Guth et al. for the sweetening zone in the apparatus of Louie et al, on the basis of suitability for the intended use and absent

Art Unit: 1764

showing unexpected results thereof, since the means of both Louie et al. and Guth et al. serve substantially the same function and effect of removal of sulfur compounds, and it has been held that the substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution. *Ex parte Novak* 16 USPQ 2d 2041 (BPAI 1989); *In re Mostovych* 144 USPQ 38 (CCPA 1964); *In re Leshin* 125 USPQ 416 (CCPA 1960); *Graver Tank and Manufacturing Co. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950). Also, the provision of “a gas inlet in fluid communication with said stripped gas outlet line [19]”, “an oxidizing agent supply line for introducing oxidizing agents to said sweetening zone”, and “a stripped and sweetened gasoline outlet line” will be inherent of the modified apparatus of Louie et al., in order to enable the feeding of reactants and recovery of product, and furthermore, the Examiner takes Official Notice that the provision of inlets and outlets is well known to those skilled in the art.

With respect to claim 12, Louie et al. (FIG. 1; column 4, line 3 to column 6, line 61) further disclose a hydrotreating zone **10** for hydrotreating the second gasoline cut **4**, said hydrotreating zone **10** having a gasoline cut inlet line which is in fluid communication with the second discharge line **4** for introducing the second gasoline cut from said fractionation column **2**, a first hydrotreated cut outlet line **12**, and a hydrogen supply line **6** connected to said gasoline cut inlet line, and a stripping column **18** having a hydrotreated cut inlet line in fluid communication with said first hydrotreated cut outlet line **12**, an H₂S outlet line (“H₂S SCRUBBING” line), and a second hydrotreated cut outlet line (exiting **18** and in flow communication with **19**).

Response to Arguments

10. Applicant's arguments with respect to claims 11-12, 15-16, and 18-24 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Matsumoto et al. is provided to illustrate the conventionality of providing the two-step process of hydrogenation with subsequent hydrotreatment.

* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is 703-305-4951. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jennifer A. Leung
March 8, 2003 JAL

Hien Tran
HIEN TRAN
PRIMARY EXAMINER